Clast Analyses of the Burnt Flint from Late Bronze Age Deposits

The Royal Docks Community School site, London Borough of Newham

by
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1. Introduction

One of the more frequent finds made on later prehistoric sites in the southeast of England and elsewhere is burnt flint. Generally, excavators see it as something of an interpretative dead end. It tends either to be filed away thoughtlessly for future study or — more usually — quantified on site and discarded. However, detailed comparisons with assemblages of both archaeological and experimental burnt flint *in context* can demonstrate the effect on site-assemblages of a variety of different processes, which relate directly to the use and disuse of features. For the study of on site activity it is a useful interpretative tool.

2. Clast Patterning

As with most categories of find, the variety of features containing burnt flint can be divided into three: those relating to its production, those relating to its use (in the case of burnt flint, often the same thing), those relating to its disposal, and those added to or disturbed by on-going or subsequent processes. In order to distinguish these, data on clast sorting and clast relationships is required.

The first comprises the fire in which the flint is heated. Different zones of heat and oxidization are reflected in the flint within it. Irrespective of its type or colour prior to burning, it cracks and changes colour. That from the edge of a fire will be less altered than that from its centre: it may, for example, fracture and yet retain its original colour. With increased heat, however, it turns first grey, and then white. If it is burned in a reducing fire it can, like other more obviously porous stone types, absorb carbon, and thus acquire a grey surface rind. An undisturbed fire in which flint has been heated will be characterized, in addition, by an accumulation of tiny flakes at its centre/base, resulting from the percolation of fire-spalls downward through it, a proportionately greater density of large clasts towards the edge, the presence of clasts that have *cracked but not disaggregated*, and the burning of the hearth itself. Owing to flint's explosive nature, those in which it was *deliberately* heated are likely to have been located away from other activity areas. Irrespective of their location, however, most *in situ* fires contain burnt material resulting from the casual discard of rubbish within them.

The second comprises the features in which the hot flint is used. The morphology of these may differ, sometimes in a ways that are interpretatively useful. Dry cooking, for example, involves the burial of food and hot stones

together, either in a pit, or above ground on a layer of stones placed on the landsurface, over which earthen material is piled. The resulting features comprise, respectively, a pit with at least two fills, the lower comprising functionally in-situ burnt stone, the upper later backfill (or sedimentation if the feature was not backfilled), which may be, but need not be stony (e.g. Chatillon-sur-Glane: Ramseyer 1991, 78, fig. 5), and a surface layer comprising burnt stones (possibly Itford Hill, hut D: Burstow & Holleyman 1957, 176). Depending on whether the flint was burnt *in situ*, and if and/or how it was moved, these may or may not contain very small clasts and other burnt material. Wet cooking, too, results in stratified features. Water added to a cooking pit in order to steam food disaggregates the cracked flint and moves charcoal down through the fire (possibly Farnham Park: Oakley *et al*. 1939, 201, fig. 86); while a feature used for boiling food must, like baking pits, provide accommodation for the food being cooked, and will therefore comprise more than one layer. In addition, boiling pits sometimes retain traces of a (wood or clay) lining to retain the water boiled (e.g. Curraghtarsna: Buckley 1986, 70). The most obvious difference between undisturbed burnt flint features used for dry cooking and undisturbed burnt flint features used for wet cooking, however, remains the disaggregation of the stones comprising them.

The third comprises primary features, which have been disturbed, and/or added to by material relating to other activities, deposits of re-used material such as post-packing, rubbish dumps, and deposits that have been altered by on-going natural processes. The first three of these are characterized by mixing, both of clasts of different size and colour, and of burned and unburned material (e.g. concentrations of stone finds at Black Patch, Alciston, East Sussex: Seager Thomas 1999). These kinds of reprocessing may be accompanied by a physical change in the material — such as comminution and disaggregation — and associations with the tools used in the activity that disturbed them (e.g. the manufacture of pottery temper at Runnymede: Needham & Sørensen 1988, 124). The last frequently retain elements of their original form, but might be stained, washed-out (charcoal, for example, often disappears over time), truncated, and so on.

3. The Royal Docks Community School Assemblage

Approximately 18 kilograms (1440 clasts) of burnt flint was recovered from 20 Prehistoric contexts (Table 1). Clasts range from small pebbles (10mm) to large pebbles or small cobbles (64mm). Most retain some of their original surface. The assemblage is dominated by water-rolled material but most contexts incorporated some that had been struck and some that retained traces of the flint's original cortex. Clasts range from those that have been scorched, but are not calcined, to those, which have been burnt white. Others have been burned white but have a glossy grey surface rind. The sample from pit 77 comprises mostly such clasts.

Owing to the similarity between material which has a grey surface rind and material which is grey throughout, it was not possible to quantify the

assemblage in terms of temperature, but layers 01 and 71 included much material which was similar in character to that from pit 77. Pit 77 and layer 71 also contained an unusually high proportion of large pebble-sized clasts. Also present were a few clasts of sandstone. (No stone type from the site, however, need have been imported). A single cobble-sized clast of sedimentary quartzite from pit 77 is of a red colour and was probably burnt in an oxidizing fire.

Fill/ layer	Cut	Feature type	Area	Nos.	Small pebbles	Medium pebbles	Large pebbles	Weight (gms)
01		buried soil		31	20	9	2	n/a
01		buried soil	centre	87	73	12	2	691
01		buried soil	west	32	25	6	1	n/a
6		alluvium		9	9	0	0	78
10	11	pit		17	14	3	0	197
12		'natural'		37	26	11	0	370
12		'natural'	west	4	3	1	0	76
13	14	pit		1	1	0	0	13
15		buried soil		9	7	2	0	182
54		fire-pit area		4	3	1	0	42
59		buried soil		4	3	1	0	42
62		buried soil		9	6	3	0	124
71		buried soil		249	183	47	19	3304
72		'natural'		187	152	28	7	1899
73	79	gully		35	34	1	0	110
74	77	cooking pit		96	65	18	13	1875
75	78	quarry pit		40	28	12	0	549
76		buried soil		240	160	71	9	3520
93	94	pit		4	4	0	0	19
96		buried soil		232	212	15	7	3208
97	98	tree root		15	12	3	0	138
101		'natural'		94	77	16	1	1031
102	103	pit		3	1	2	0	40

Table 1. Quantification of the burnt flint from the Royal Docks Community School site

The baking pit.

In terms both of clast morphology and clast distribution, the evidence from pit 77 was consistent with what would be expected of a pit used for dry cooking or baking. Field observations suggest that the fill was charcoal-rich throughout, although the charcoal itself was completely degraded. Clasts have a grey surface rind indicating that they had been heated or buried in a carbon-rich environment. The concentration of burnt flint increased towards the base of the cut, and, though deeply cracked, many of the clasts from it remained intact, suggesting that they had not been disturbed after burning. Furthermore the pit, which was in an elevated position, was badly placed in terms of water retention. The recovered assemblage, however, contains few very small clasts of the sort which characterize fires in which flint is heated, suggesting either that the sample is not representative of the fire as a whole or that the latter was kindled elsewhere before being bulked into the pit. The occurrence within it of a clast of reddened quartzite perhaps supports this latter view.

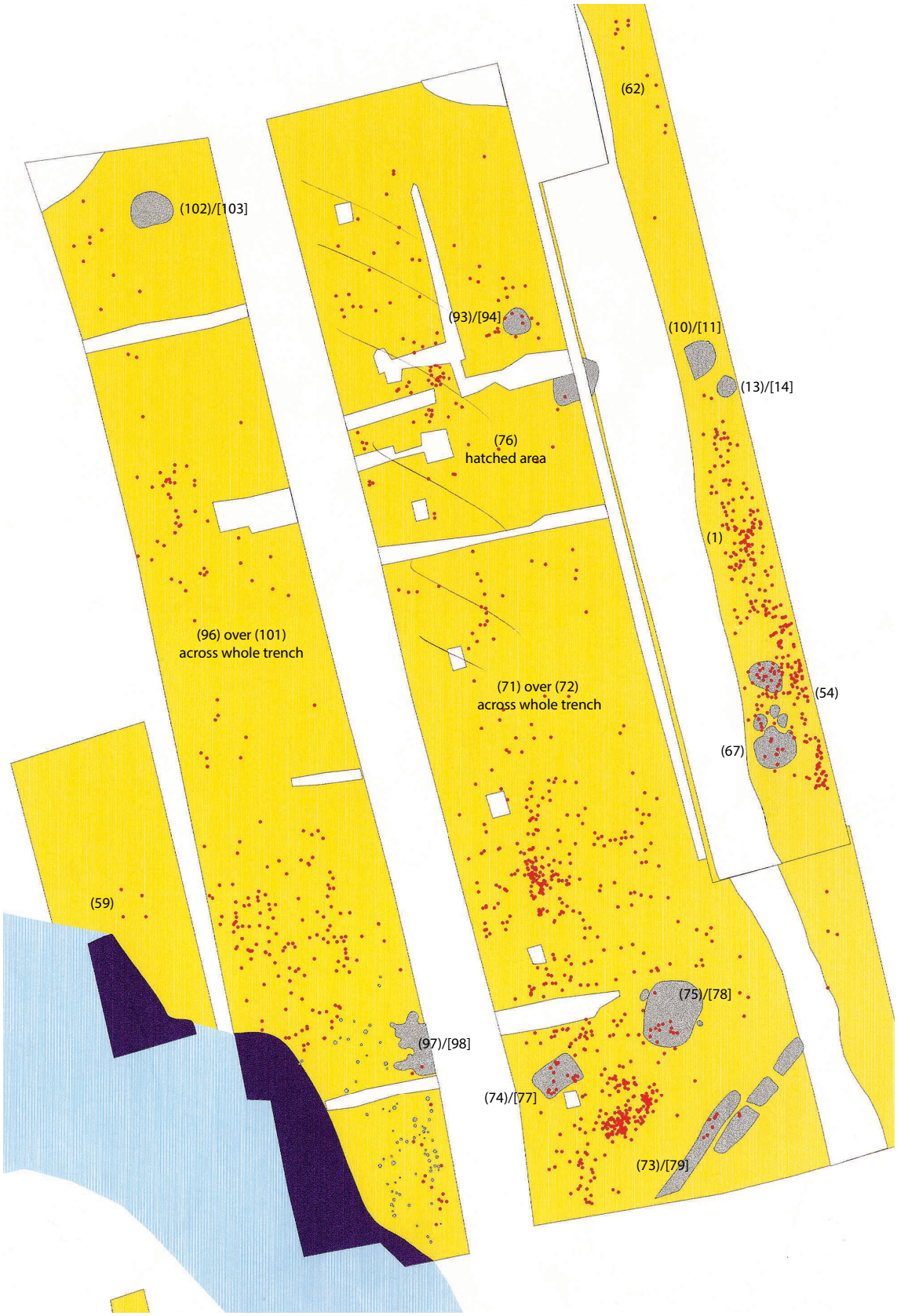

Figure 1. GIS plot of burnt flint from the Royal Docks Community School site

The hearth area.

Too little data is available from the hearth area to interpret its role in relation

to the burnt flint associated with it with any confidence (only four clasts were retained from layer 54). However, the dense concentration of burnt flint in the vicinity strongly suggests the possibility that flint was heated here. If so, a second — unidentified — activity involving the use of burnt flint may be indicated. Since large quantities of flint are unlikely to have been processed in a domestic activity area, unburned cultural material from this part of the site would most likely relate to a different phase of activity.

The old landsurface.
In addition to those found in or close to cut features, several concentrations of burnt flint were identified on the old landsurface (Fig. 1). All of these were mixed with unburnt cultural material. The occurrence within layers 01 and 71 of a high proportion of clasts with a grey rind identical to that found on clasts recovered from pit 77 almost certainly relates to earlier episodes of baking, perhaps two in pit 77 (close to which there were two surface concentrations) and an indeterminate number in an unidentified pit close to the hearth area. This, however, still leaves a large proportion of flint which has been burned white but which lacks a grey surface rind unaccounted for. This may relate to incidental burning, to an episode of pit cooking in which the fire used to heat the flint was oxidizing, or the unidentified activity postulated above. Owing to the lack of detailed data on clast patterning, it is not possible to identify which. Likewise it is uncertain if the small clast size of material from the old landsurface is the consequence of burning or of physical abrasion prior to or during excavation.

Other cut features.
Pit 78 alone was cut both into the underlying gravel and (?)left open. It is temptingto suggest that it was the source of the flint used for burning.

4. Conclusion

The examination of the burnt flint assemblage suggests a variety of things relating to the use and re-use of the site during its Late Bronze Age occupation. Firstly, the material from pit 77 is *in situ* and was used for baking, not boiling or producing steam. Secondly, the pit may have been re-used. There is no evidence, however, for repeated re-use. Thirdly, the greater part of the assemblage was probably heated *in situ*, and not introduced into it from outside. Fourthly, the fire was reducing. Fifthly, a further baking pit *may* have located to the northwest. Again, however, there is no evidence for repeated re-use.

A number of questions remain unanswered, in particular those relating to the distribution of burnt flint on the old landsurface. Two things are missing. Firstly, in the case of layer 54, a complete or representative assemblage; and, secondly, details of patterning. Because of the nature of the sampling strategy employed on site, these cannot now be provided. At sites under excavation, however, they may be. Ideally everything from a section or transect should be

retained and plotted three-dimensionally. Then it would be possible for the specialist to reconstruct diagnostic features. But at the very least a representative sample should be retained and a note made of the relative positions of different sizes and colours of clastic material.

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